



UTM Drone Tech

Demo 2, Multi-site

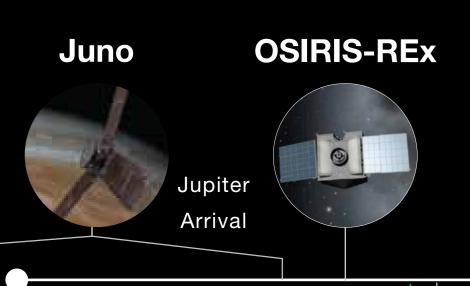


All-Electric X-57 Low-Boom Sonic Demonstrator **First Flight** First Flight

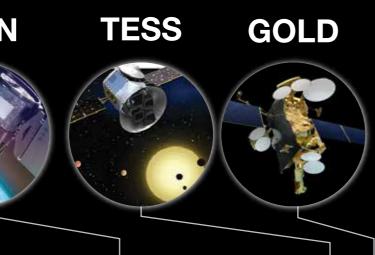


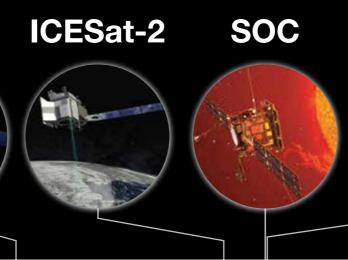
ATD Automation Tools to FAA

Science Mission Launches



ICON

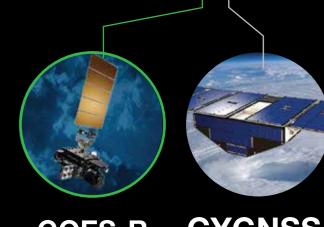




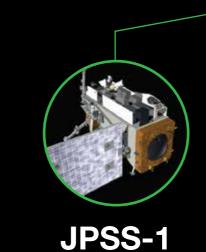




Reimbursable Missions

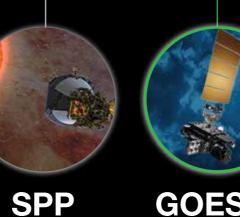


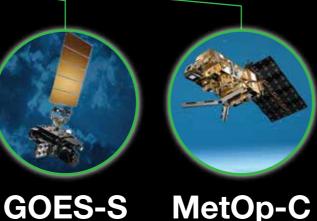




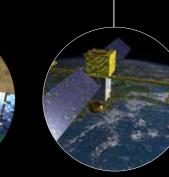












SWOT



CubeSat Launch Initiative (CSLI) Ongoing through 2021 and Beyond

Science Instrument Deliveries to ISS Through 2021*

Cold Atom Lab (CAL) Cosmic Ray Energetics and Mass (CREAM) ECOsystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOTRESS)

Educational Launch of Nanosatellites (ELaNa) GeneLab Phase 2 and 3 Global Ecosystem Dynamics Investigation (GEDI) Life Sciences Glovebox Multiple User System for Earth Sensing Facility (MUSES) Neutron Star Interior Composition Explorer (NICER)

Orbiting Carbon Observatory (OCO-3) Stratospheric Aerosol and Gas Experiment (SAGE-III) Total and Spectral Solar Irradiance Sensor (TSIS-1)

Capability Upgrades and Technology Demonstrations Aboard ISS*

Bigelow Expandable Activity Module (BEAM) **Exploration ECLSS Systems Exploration Exercise Devices**

Exploration Medical Devices International Docking Adapter (IDA) Refabricator

Roll-Out Solar Array (ROSA) Spacecraft Fire Experiment (SAFFIRE) Station Explorer for X-ray Timing and Navigation Technology (SEXTANT)

Universal Waste Management System (UWMS) Zero Boil Off Tank (ZBOT)

* programs listed here include items funded by AES, SLPSRA, HRP, STMD, and SMD

Commercial Cargo Resupply Missions to ISS Ongoing Through at Least 2024

International Space Station (ISS)

Expedition 47 NASA **Astronauts Tim Kopra**



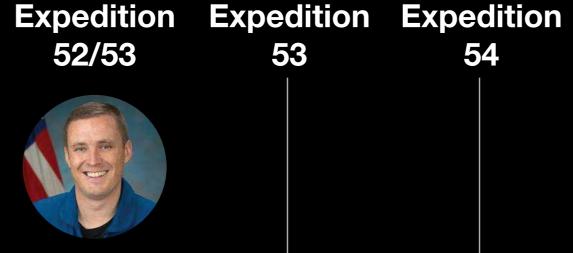


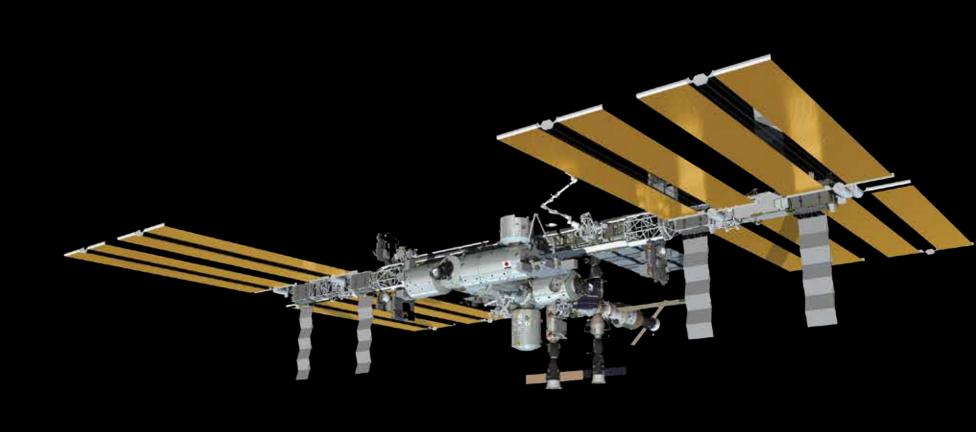












Expeditions continue through at least 2024

Commercial Crew Program (CCP)



Orion

Crew Module

Pressure Vessel

on Dock at KSC

Boe

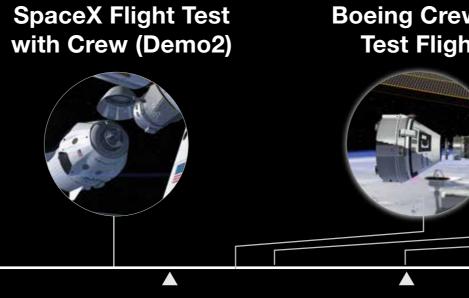


Collaborations for Commercial Space Capabilities



Astronaut Class Selection June 2017



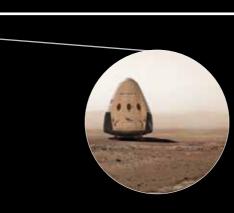


Boeing Crewed Test Flight Boeing SpaceX PCM-1 Flight **PCM-1 Flight**

Commercial Crew launches continue through at least 2024

Initial Commercial Crew Astronauts

SpaceX launch of Red **Dragon mission to Mars**



SpaceX Red Dragon Entry to Mars surface

Advanced Exploration Systems (AES) for Habitation and Propulsion

Orion, Space Launch System (SLS), and Exploration Ground Systems (EGS)



Orion

Crew Module

Initial Power On





Mars-class In-Space Propulsion

NextSTEP-2





Approach Selection EM-1 Secondaries

Lunar Flashlight, Near Earth Asteroid

JAXA SLSLIM, ESA ArgoMoon, JAXA

Scout, Bio Sentinel, LunaH-MAP,

CuSPP, Lunar IceCube, Skyfire,

EQUULEUS, STMD Centennial

Challenge Winners.



ORION Ascent Abort 2 (AA-2) Test

Through 2021 and Beyond

Through 2021 and Beyond

Other missions with AES funding

SLS SLS Qual Motor-2 (QM-2) Booster Qualification Test



Validation Testing

SLS SLS Interim Cryo

Propulsion Stage

Complete

EGS

Pad B Ready for

Verification/

Validation

Testing

SLS SLS Core Stage Delivered to Stennis Space Center (SSC) for Green Run Testing

Orion

Crew/Service Module

Delivery to Ground

Systems Development

and Operations

(GSDO)

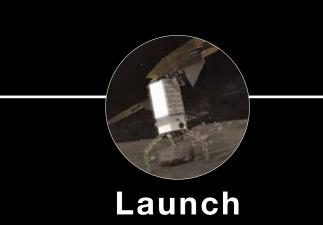


EM-2 Launch

Asteroid Redirect Robotic Mission (ARRM)

Preliminary Design Review





Space Communications and Navigation (SCaN)

Launch Communications Stations (LCS) at Ponce de Leon (PDL) and Kennedy Uplink Station (KUS)

Tracking And Data Relay Satellite (TDRS)-M Launch

Deep Space Atomic

Antenna: AS2 Alaska Satellite Facility, AK, USA

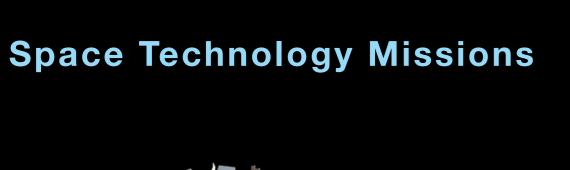
Ka-band **Augmentation: AS3** Alaska Satellite Facility, AK, USA

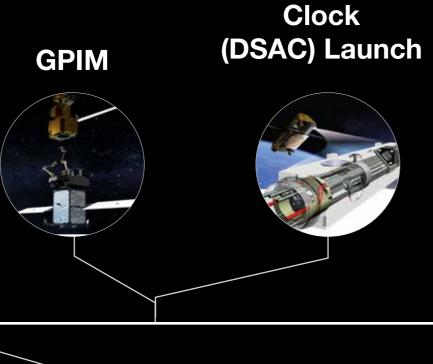
DSS-56 Madrid, Spain

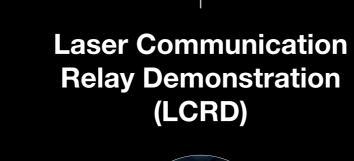
Integrated LCRD LEO (Low-Earth Orbit) User **DSS-53 Modem And Amplifier** (ILLUMA)-T Flight Demo Madrid, Spain on ISS

NEN Antenna Punta Arenas, CH

DSS-36 Canberra, Australia







Mars 2020 MOXIE MEDLI-2 Terrain Relative Navigation (TRN)

Deep Space Optical Communication (DSOC)







www.nasa.gov

Technology (SEXTANT)